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HAMILTON ASSOCIATION.

PAPER BY PROF. WRIGHT.

RECENT EXPLORATIONS IN AFRICA

The first meeting for the year of the Hamilton Association was held on the evening of January 6th, in the Council Chamber, City Hall. A considerable number of visitors was present, including several ladies. After routine business had been disposed of, Professor Wright, of the Wesleyan Female College, read the following paper on the above-mentioned subject:

GEOLOGY PECULIAR.

The geological formation of Central Africa is primitive—showing an altitude above the sea level averaging nearly 4,000 feet. This elevated portion of the globe, built up in great part of granite sandstone rocks, has never been submerged, nor does it appear to have undergone any changes, either volcanic or by the action of water. Time, working through countless ages with the slow but certain instrument of atmospheric influence, has rounded the surface and split into fragments the granite rocks, leaving a sandy base of disintegrated portions; while, in other cases, the mountains show as hard and undecaying a surface as though fresh from Nature's foundry.

Along the coasts there are tertiary formations containing shells similar to those of the adjoining sea; but, as the traveler penetrates to the elevated table-lands of the interior—all of them on an average 4,000 feet above the level of the sea—he leaves all trace of calcareous rocks, and finds only the native granite, sandstone and trap rocks.

The surface of this vast interior is entirely exempt from the coarse, superficial drift that encumbers so many countries, as derived from lofty mountain chains, from which either glaciers or great torrent streams have descended. All other continents have been successively submerged under the ocean to receive calcareous deposits. Thus, Africa, in a geological sense, is unique among the continental systems.

NILE ANOMALIES.

Egypt has been an extraordinary instance of the actual formation of a country by alluvial deposit; it has been created by a single river. The great Sahara, that frightful desert of interminable, scorching sand, stretching from the Red Sea to the Atlantic, is cleft by one solitary thread of water. Ages before man could have existed in that inhospitable land, that thread of water was at its silent work; through countless years it flooded and fell, depositing a rich legacy of soil upon the barren sand, until the delta was created. Thus furnishing a land of uninterrupted productiveness and having an unrivaled position for commerce, it took the lead in history as the most civilized and prosperous land upon earth.

As the Nile was among the first of known rivers, so it was unlike all others. In July and August, when European streams were at their lowest in the summer heat, the Nile was at the flood! In Egypt there was no rainfall—not even a drop of dew in those parched deserts, through which

for 860 miles of latitude the glorious river flowed without a tributary. Licked up by the burning sun, and swallowed by the exhausting sand of Nubian deserts, supporting all losses by evaporation and absorption, the noble flood shed its annual blessings upon Egypt. An anomaly among rivers; flooding in the driest season; unwasted in sandy deserts; where was its hidden origin; how explain its mysterious flow?

LAKES UNLIKE OTHERS.

Not only is the geology of Africa peculiar and its river system anomalous, but its lakes follow rules unlike those of most other lakes in the world. It has been a maxim of physical geography that lakes without outlets to the sea become salt, and the Caspian and Dead Seas of Asia and the Salt Lake of the Mormons were adduced as examples. But Clapperton and Barth found that Lake Tchad had no outlet and was quite fresh, and Burton and Livingstone found the same true of Lake Tanganyika, a magnificent lake three hundred miles in length, with the probabilities of a like result for several other lakes in the great table lands of Central Africa. Instead of deciding that isolation produces saltiness, it will have to be left to geology to determine what sort of strata around a lake will produce brackishness, and what sort will have the opposite effect.

ZANZIBAR.

Most of the recent discoverers have entered Africa by the way of Zanzibar. They reach it by the way of the Red Sea and Aden on the straits of Babel-mandeb. Zanzibar is a tropical island of wonderful beauty and fertility. Unlike its larger neighbor, Madagascar, it has a very slight altitude above the sea, and everywhere shows the hand of cultivation in rich plantations of sugar, cloves, gum, rice, &c. The capital, holding about half of the population of the island, about 100,000 inhabitants, is thoroughly Arabian in its appearance with its flat-roofed buildings and occasional mosques. The Government was for-

merly united to that of Muscat, in Arabia, but now there is an independent Sultan for each. The Arabs are the ruling and the Negroes the working class. There is a third class—consisting of about 5,000 natives of India, called Banyans, who have been British subjects, and these do most of the money lending and trading both for the island and the mainland. Dr. Kirk is now the British Consul at Zanzibar, and Capt. Webb the American.

CAPTAINS BURTON AND SPEKE.

It was here that Messrs. Burton and Speke fitted up the first expedition for the interior in 1856. Caravans under the control of Arab traders had made regular journeys inland for scores of years, but no European had ever been seen upon the route. These traders brought back large numbers of slaves and great quantities of ivory, the tusks of elephants killed in the interior. They took with them for barter three things, cotton cloth, brass wire and beads,—the first for clothing, the second for coils, which the natives wear as ornaments around their wrists and ankles, and the third for chains about their necks.

Burton and Speke formed a caravan, much as an Arab trader would do, and took the same articles with them to pay their way. These traders during the course of their long traffic, have trained two classes of negro servants from the interior, the first to carry arms and be their guard, and the second to be porters and carry all the merchandise. Horses, oxen and camels rapidly die off in this part of Africa, somewhat from the climate, but chiefly from the attacks of a fly, called the tsetse fly, whose bite is death to them. It is found not to be hurtful to men or donkeys, and this may furnish a secondary proof of the Darwinian theory! Arabs are also necessary in a caravan as guides and leaders; and now comes the tedious part in the traveler's narrative. It is a constant history of stoppages instead of journeys. The squabbles, quarrels and mutinies

of the incongruous elements of the caravan, the miasmatic jungles that are almost impassable, the intermittent fevers that keep half of the company sick—in reference to which Stanley gravely remarks towards the last of his journey, that he was enjoying his 29th fever—the petty negro chiefs, that exact enormous tribute, the poor diet of maize, rice and occasional animals that are bought or shot; monotonous succession of miserable, half-clad savages, whose savage huts and equally savage mode of life must of necessity all be described—well, we leave all these things for readers to enjoy themselves in the pages of the travelers, simply premising that Stanley has been acknowledged by all English critics to have given the most readable book in the list.

DISCOVERY OF L. TANGANYIKA.

The many difficulties just described explain why it has taken each of the expeditions about a year to pass over the 500 miles to Lake Tanganyika. The first fifty miles from the coast is swamp, and is much dreaded from its malaria and hostile tribes, who being near the coast have learned the use of firearms. After the first mountains are reached, there follow the great table-lands of the interior, about 3,000 feet above the level of the sea. After two thirds of the journey is passed the now noted stopping place of Unyanyembe is reached. Here the Arab merchants have made a large settlement, building superior houses to those of the natives, and living in considerable luxury. They are very hospitable to travelers, entertaining them for weeks, and giving them such scanty information as their travel for slaves and ivory among the hundreds of tribes beyond have afforded them. Burton attributes excessive stupidity to the negroes, for he says they could not tell him accurately of places and rivers not twenty miles from where they had spent all their lives. Livingston is much more hopeful of the African race. The limits of our paper entirely prevent us from describing the productions of the country, its minerals, and its

plants, or the manners and customs of the people. We will simply mention that most of the families practice spinning and weaving, though they prefer to obtain by barter English and American cottons. Their method of reducing iron ores, which abound among the sandstone rocks, and give a red color to the soil, deserves a short description. They make a sort of oven in the earth in which they place the charcoal and the ore. For bellows they take an earthenware kettle, having a tube from the bottom reaching into the fire, cover the top with leather, to which is attached a handle. This handle working something like a churn, as it descends depresses the leather cover, and that pushes the air before it into the fire. Whether they have taken out a patent for their discovery I cannot say, but they make very efficient implements both of husbandry and war.

The next ivory and slave mart beyond Unyanyembe occupied by Arabs is Ujiji on the eastern shore of Lake Tanganyika. Here Messrs. Burton and Speke had the exquisite pleasure of being the first travelers to behold this beautiful inland lake; and here, fourteen years after, Stanley had the equally great delight of meeting and supplying the wants of Africa's great explorer, the long lost Livingstone. These first travelers tried in boats to reach the head of the lake, but from hostility of the tribes could only go within 10 or 12 miles of it. They desired to ascertain whether the river at its head flowed into it or out of it to the north, in which case it might be connected with the Nile. It was reserved for Stanley and Livingstone to solve the doubt by ascertaining that it flowed into the lake, and hence was entirely disconnected from the Nile. For this exploit Stanley received the gold medal of the Royal Geographical Society.

DISCOVERY OF VICTORIA N'YANZA.

On Messrs. Burton and Speke's return to Unyanyembe, the latter was dispatched northward about 100 miles to the locality of a reported lake, and

here in August, 1858, Capt. Speke reached the southern extremity of a lake, which he named the Victoria N'Yanza, and which he at once declared in his opinion to be the long-sought source of the Nile. The two travelers were never friends after this, and published their books separately with many disparaging allusions to each other. I should say these and most travelers, who followed them, were officers of the English army, and had been well fitted for the work by a life of adventure in the jungles of India.

CAPTS. SPEKE AND GRANT.

Speke, after reaching England, received help to form another expedition, and in connection with Capt. Grant entered Africa again from Zanzibar with the usual motley caravan, but this time with the advantage of some Arab leaders, who had been in the former expedition. The next year Sir Samuel Baker, accompanied by his wife, resolved to enter upon this region of exploration, fascinating from its very perils, by going up the Nile from Egypt towards its source with the hope of meeting Capt. Speke as he came towards the north. Messrs. Speke and Grant followed the caravan route to Unyanyembe, came northward to the south end of Victoria N'Yanza—followed the lake for a short distance—were compelled to leave it and take their course to the west and then north—but after some months, to their great joy, sighting, as they think, the same lake again, they follow it to its northern extremity, and there equally to their delight find that the waters of the lake flowed out of it in a fine stream to the north. Thus the goal was almost reached. They followed the stream northward—were forced to leave it—but traveling north-west struck it again at a point where there were some falls, and where Kamrasi, the head chief of a very large district, resided, and showed them the greatest hospitality. They heard here that the river flowed westerly and entered a lake, and then the waters of this lake flowed out again to the north.

They could not investigate the truth of this, but pursued their course, coming upon the Nile again, and reaching, at last, Gondokoro, the remotest trading station from Egypt towards the sources of the Nile.

SIR SAMUEL BAKER.

Their joy can be imagined when they found Sir Samuel Baker and his expedition here ready to give them a hearty reception. Sir Samuel describes the meeting as follows: "I heard guns firing in the distance. Some ivory trader's caravan seemed approaching. My men rushed madly to my boat, with the report that two white men were with them, who had come from the sea! Could they be Speke and Grant? Off I ran, and soon met them in reality. Hurrah for Old England! My countrymen had really discovered the source of the Nile! The mystery of ages is solved! When I first met them, they were walking the banks of the river towards my boats. At a distance of about a hundred yards, I recognized my old friend Speke, and with a heart beating with joy I took off my cap and gave him a welcome 'hurrah!' as I ran towards him. For the moment he did not recognize me; for he had not seen me for ten years, and as I was totally unexpected, my sudden appearance in the center of Africa appeared to him incredible. We were shortly seated on the deck of our boat under the awning, and such rough fare as could be hastily prepared was set before these ragged, careworn specimens of African travel, who had not for three years seen the face of a white man, friend or foe. As a good ship arrives in harbor, battered and torn by a long and stormy voyage, yet sound in her frame and sea-worthy to the last, so both these gallant travelers arrived at Gondokoro. I looked upon them with pride as my countrymen." The travelers took their faithful company of 18 blacks, now immortalized as Speke's faithfuls, down the Nile, kept them at Cairo for some time seeing the sights, had their photographs taken to adorn his book of travels, and

sent them on their way loaded with presents, by the Red Sea and Aden, to their home in the sunny isle of the Equator—Zanzibar. It now remained for Baker to find the other reported lake, and see if it also was connected with the Nile. This would involve on the part of himself and wife, a two years' conflict with tropical fevers and tropical savages, but they were ready for the sacrifice. He says in his journal, "Had I been alone it would have been no hard lot for me to die upon the untrodden path before me, but there was one who, although my greatest comfort, was also my greatest care. I shuddered at the prospect for her, should she be left alone in savage lands at my death; and gladly would I have left her in the luxuries of home instead of exposing her to the miseries of Africa. It was in vain that I implored her to remain, and that I painted the perils still blacker than I then imagined them myself. She was resolved, with woman's constancy and devotion, to share all dangers, and to follow me through each footstep of the wild life before me." He succeeded in taking up the clue where Speke had left it; followed Speke's Nile, till it emptied into a noble lake, only, however, soon to issue forth again at its northern end to form the great White Nile; thus giving two great lakes as the real sources of the Nile. He named his Lake, Albert N'Yanza, as a counterpart to Victoria N'Yanza. He was unable to go far south on the Lake, and he was also compelled to leave the exit of the waters at its northern extremity unexplored.

DR. LIVINGSTONE.

We now turn to the labors of Dr. Livingstone. David Livingstone, at the age of 18 and 19 was a cotton weaver in a manufactory on the banks of the Clyde near Glasgow. Always ambitious of learning, he at length succeeded in saving enough from the earnings of a part of the year to devote the rest of it to the studies of the medical profession. In time he took his degree, but now formed the purpose of becoming a

missionary to foreign lands. He placed himself under the training of the London Missionary Society, at first proposing to go to China, but this being closed by the opium war his attention was called to Southern Africa by the successful labors of the Rev. Robert Moffat, and in 1843 he began his toils in that country. All the districts in southern Africa have made great progress of late years in Christianity and civilization. Scores of evangelists, both English and native, are cultivating this field with success, giving proof that the African character is capable of fine development. After a few years Livingstone gave himself chiefly to exploration. In 1849 he discovered Lake N'Gami, a small lake in southern Africa.

ACROSS THE CONTINENT.

From 1852 to 1856 he went entirely across this part of the continent, through parts never before explored, taking in his course the great river Zambesi and across to the Portuguese possessions in Angola. The town he reached on the coast, called Loanda, contains 10,000 inhabitants, many of them Portuguese, with a fort, church, stores and even schools.

The Portuguese Bishop was very kind to Livingstone, who remained here some time to recruit his health. The Bishop, who is Governor also, makes great efforts to introduce schools and to have legal marriage ceremonies introduced among the natives. In following the Zambesi to the opposite sea coast, he found the falls of Zambesi, among the most wonderful in the world. The Portuguese also rule on this coast, and trade with the interior for ivory and slaves. He now returned to England and published his travels, which are brought down in this book only to the year 1856.

LAKE N'YASSA

He spent three years afterwards in the region north of the Zambesi, with some other travelers, and fully investigated a new lake, called N'Yassa, which has an outflow into the Zambesi.

LAST ENTRANCE INTO AFRICA.

In 1866 he made his last memorable entrance into Africa, from the same point as the two expeditions of Messrs. Burton and Speke, viz, Zanzibar—but from there taking a more southerly route. Within a year he had reached a point somewhat south of Lake Tanganyika. Here he was deserted by one of his Arab leaders, named Musa. This Arab eventually found his way to Unyanyembe, and, to cover his own perfidy, made up the story that Livingstone had been killed in a conflict with the natives near a southern lake. This account, reaching Zanzibar, caused the suspense and anxiety of many years in England in reference to his safety. One or two of his letters, out of scores sent by Arab caravans, reached Sir Roderick Murchison, and this well-tried friend never doubted the explorer's safety. Murchison, however, himself died just before the triumphant exploit of Stanley, and one of the latter's saddest offices was to give the news to the veteran traveler.

DISCOVERY OF SEVERAL LAKES.

In his far isolated position Livingstone continued his researches, and then followed the brilliant discovery of an entirely new river and lake system in Central Africa. He had formed the opinion as expressed in his book of travels in 1856 that the central portions of Southern and Equatorial Africa were elevated table lands, but generally depressed in the middle in north and south lines. This depression was the cause of Lake N'Gami in the south. The Zambesi had a long southern direction from the same reason. The line of the N'Yassa Lake was north and south. The Tanganyika of Burton and Speke just the same. Thus he predicted farther west was a great central watershed, with rivers and lakes. It was reserved for him to verify the correctness of his own prophecy. He passed over 600 miles of this great watershed to the west and southwest of Lake Tanganyika, finding at the south Lake Bangweolo, then Moero,

then Kamolondo, hearing of a lake to the southwest which he called Lake Lincoln, and an unknown one to the north which he could not reach, all connected by a river named sometimes Luapula, and sometimes Luabala, which he describes as a vast river like the Mississippi—probably more remarkable for width than depth. In the midst of these weary wanderings amongst tribes never before visited by whites, he made one return eastward to Ujiji, the great ivory and slave mart for Zanzibar and the sea coast. Here he hoped to find supplies, but in this he was disappointed—the repeated attempts of the British Government and his friends being frustrated by the villany of the caravans. Leaving a small depot of goods at Ujiji, in charge of an Arab (only to find it used up when he came to claim it), he plunged again into the unexplored wilds of a district called Manyuema. This was a region abounding in ivory. The Arab traders had only entered it within two or three years. The natives had never seen firearms, and the Arabs could practise barbarities which they would not dare to engage in with tribes nearer the coast. Hence they would burn villages, make a wholesale slaughter of the natives, capture all the youths for slaves and all the ivory for barter, and retreat toward the coast with their ill-gotten gain. Livingstone followed up his great river into this region to the 4th degree of south latitude; heard of a great lake in advance of him, but from the lack of supplies and the hostility of the tribes, who confounded him with the Arabs, he was forced to turn back. He arrived at Ujiji in October, 1871 (after five years of travel from Zanzibar), much exhausted and worn by fatigue. He found that his supplies had been wasted by the Arab under the excuse that his master was probably dead; those sent from Zanzibar had been stopped at Unyanyembe, and had also disappeared.

MEETING WITH STANLEY.

On the 10th of the next month Livingstone was startled and rejoiced

by the firing of gun and shouts of the natives that a white man and his caravan were descending the mountains to the town. Soon he grasps the hand of Stanley, and he finds himself all at once from being a poor, dispirited traveller five hundred miles from help, now rich in the possession of all that his heart could wish. Many long hours it took him to hear and read the news of the outer world, from which he had been cut off for five long years, and many hours it required him to tell to his adventurous rescuer the story of his hardships and discoveries. After five months living and travelling together they parted with mutual regret at Unyanyembe. Dr. Livingstone describes his latest plans in a letter dated on the 1st July last summer as follows: He will spend eight months in going over the southern line of his discoveries on the great watershed, so as to be sure of many points undetermined. On this route he is already acquainted with the chiefs, and would find them friendly. Having accomplished this route, he will thank Providence and return home. He does not seem to intend to take up the line of exploration broken off at the north. Probably he thinks the Manyema too hostile. He is strongly of the opinion that this river system continues on to the north till it empties into the the Albert N'Yanza, the lake discovered by Sir Samuel Baker. Yet the purport of the letter does not seem to us to give any encouragement to the conclusion that Livingstone himself hopes to solve the problem. He states in the same letter, that Arab travelers of experience have told him that there were three or four lakes of the so-called Victoria N'Yanza instead of one.

EXPEDITIONS NOW IN PROGRESS.

Another expedition, now in progress in Africa, claims much of our interest. Sir Samuel Baker, determined not to leave his work unfinished, has gone to the Nile sources by the same route as before. He left Kartoum in February, 1870. He carried with him the materials for boats to be carried above all the

rapids, and then be put together, and provided with steam power, on the White Nile near the Albert N'Yanza, so that he could proceed unhindered to the hitherto unvisited southern shores of that lake. Dr Livingstone mentions, in his letter, the possibility of his meeting Baker. The telegram of New Year's day announces that Baker has been attacked by hostile tribes, and that the Government of Egypt has sent troops to his help. The British Government has been aroused by the appeals of Dr. Livingstone to put forth new efforts to destroy the slave trade. It has sent out to Zanzibar, as a commissioner, Sir Bartle Frere with a British gunboat with authority to aid in abolishing the traffic, which is the curse of Africa, and keeps it back from taking its place among the civilized portions of the globe.

The spirit of discovery is still active in reference to this hitherto unknown land. There is much anxiety being felt in England in reference to Dr. Livingstone, from the fact that his outspoken denunciations of the slave trade will make his return to the East Coast highly dangerous; and subscriptions are being raised there for an expedition, to be headed by Dr. Glassfield, the Glacier explorer, to enter Africa on the Western side, and reach him from the sources of the Congo. Another company, under Lieut. Cameron, enters Africa on the east, above Zanzibar, to see if the Victoria N'Yanza is one or four lakes; and still another (German) party is preparing to engage in the exploration of the Congo.

RAINY SEASONS AND NILE OVERFLOW.

Upon no subject connected with Africa have I had more difficulty in coming to satisfactory conclusions than on that of the Nile. The meteorology of Eastern Africa is an entirely new subject, and the facts thrown out concerning it are scattered through all the books of travel, and have required a great amount of investigation to harmonize them into a consistent system. The rains of Eastern Africa are local in their character,

and follow the normal type of tropical rains, being dependent upon the sun, as it takes its course to the north or to the south. When the sun is over South Africa in February, it heats the air strata above the land in these parts, they rise and moist currents are drawn in from over the sea, causing copious rains. Accordingly Livingstone states the rainy season of the Zambesi at lat. 12° south, is in February, March and April. Burton makes the rainy season of Zanzibar, lat. 6° south, March April and May. Baker dates the same season at the Nile Lakes feeding the White Nile, on the Equator and a little north, in April, May and June, and the same author makes the Blue Nile and Atbara, which receive all the waters of Abyssinia, flood in June, July and August. Thus the rainy seasons follow the sun, and the waters are drawn from the Indian ocean to the south east. Now we see the explana-

tion of the rise of the Nile in Lower Egypt. It begins to swell in June, reaches its greatest height in July and August, and during October and November slowly diminishes to its ordinary level. The Lakes Victoria N'Yanza and Albert N'Yanza receive the rains early in the spring, and keep the long course of the White Nile in a full, steady stream, and these being reinforced by the wild torrents filled with red mud, which rush down from the Abyssinian mountains during the rains of summer, send down for 1,500 miles to old Egypt, where not a drop of rain falls during the year, and which dwells under a scorching sun, those treasures of life-giving moisture and fertile sediment, which have made its broad acres the granary of the world. The great desert of Sahara being so far inland and so hot from its sands receives no moisture throughout the year.



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